

CONSTRUCTION OF MACADAM ROADS.

By HOMER TEETERS,
Engineer, Jay County.

Due to the different traffic conditions of today, specifications for plain macadam construction should be changed. We all appreciate that the foundation is a most important item in road construction. It is an easier matter to resurface when a wearing course has worn out if originally a suitable foundation has been built. For this reason I suggest the following specifications for a macadam base:

Upon the well rolled and compacted sub-grade, the foundation course shall be built in two courses. Place uniformly a 4 inch layer of crushed limestone passing a $3\frac{1}{2}$ inch ring and retained on a $1\frac{1}{2}$ inch ring, uniformly graded. This course should then be gone over with a spiked tooth harrow or approved stone rakes to get a surface of stone as uniform as possible. This course shall be thoroughly rolled with a self propelled roller, weighing not less than ten tons, and rolling until the stone does not creep or wave ahead of the roller. A sufficient amount of stone screenings, from dust to stone passed by a $\frac{3}{4}$ inch ring, shall be spread uniformly on this course from piles which have been previously dumped alongside of the road, and well swept or brushed into this course with steel or rattan brooms until the voids are thoroughly filled. Then all excess screenings shall be swept off. Upon this course there shall be uniformly spread a second course of 4 inches using stone from $2\frac{1}{2}$ inches to $1\frac{1}{2}$ inches. This second foundation course shall be thoroughly rolled with a ten ton roller until the stone does not wave or creep ahead of the roller, after which screenings shall be applied in the same manner as in the first foundation course. This course shall be thoroughly rolled until no voids appear. Water from sprinkling wagons shall then be applied to the surface and the rolling continued, rolling in sections of not more than 300 to 400 feet. As the water causes voids to appear, additional screenings shall be added and rolled in until the foundation becomes solid and free from voids.

My reason for recommending a foundation built in two courses is that, by so doing, we can obtain a much firmer base. It is necessary for the average heavy type traffic to have at least 8 inches of thickness after compression, and it would be impossible to roll this all in one course and obtain the compression necessary for a well constructed base.

Due to present traffic conditions, the top course should not be watered and rolled as in former days, but stone passing an

inch ring and retained on a $\frac{1}{4}$ inch ring with sufficient amount of fine material to give proper bond should be uniformly spread over the prepared foundations. This surface of $\frac{3}{4}$ inch chip can be easily maintained by dragging.

It is my opinion that the $\frac{3}{4}$ inch chip has solved the maintenance problem of macadam construction. In referring to the $\frac{3}{4}$ inch chip, I would not require this exact size in all instances, as varying conditions might require a slightly larger or smaller chip. I firmly believe that giving the proper attention to building of the macadam base, providing for a broad foundation, not too much crown and good drainage, the chip wearing surface will take care of a big part of our county traffic.

NEW DEVELOPMENTS IN ROAD MAINTENANCE.

By A. H. HINKLE,

Superintendent of Maintenance, Indiana State Highway Commission.

I shall confine my paper to a few subjects which will be of most interest to you either because of some new feature about them or because I believe their importance is such as to deserve emphasis in connection with highway maintenance.

Plugging Breaks in Roads During Spring Thaws.

Every spring finds us with certain bad places in our gravel and stone roads, and other types have been known to develop their "sink holes." These breaks occur sometimes year after year at the same place, due to wet weather springs or poorly drained places in the roadbed. I might cite as a concrete example, a mudhole we "plugged" four years ago this spring which a local citizen who was forty-eight years old, said had appeared every spring for forty years."

It is not uncommon for deposits of quicksand or such a quality of clay to be encountered that the breaks are expensive to repair while the wet season is on. For the plugging of such breaks nothing is better than a layer of cinders to be covered with gravel, stone or other road surfacing materials for a wearing surface. The cinders will "choke" the mud hole and destroy the high capillarity of the soil much quicker than gravel. The mistake must not be made, however, of putting on the cinders and not covering them, for the cinders have a very low wearing value and during the dry summer will wear and blow away rapidly.